

# Helping Restore Our Stream

## Streamside Activities

### Do's and Don'ts by the Stream

#### Important Safety Information:

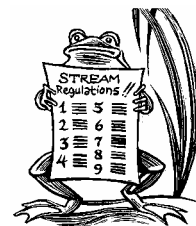
When you visit the stream, be sure you remember every one of these Do's and Don'ts. It's easy to hurt yourself around a stream if you don't know what to look for or what to do.

#### Do's

- ▶ Stay near a friend at all times. If one of you gets hurt, the other will be nearby to help or to call for help.
- ▶ Wear long pants, long sleeves, and socks to protect your body from poison ivy and insects.
- ▶ Wear shoes that won't be ruined if they get wet. Washable tennis shoes work well for walking along a stream. If you will be wading, rubber boots are best.
- ▶ Watch for swift currents. If the water looks like it might be moving fast, it could carry you with it! Have your teacher check the current before entering the stream.
- ▶ Wear bright colors. It's easier for others to see you. In hunting season, it's a must!
- ▶ Be a good stream neighbor. Crawl under fences; if you climb over a fence you might break it. Close all gates after yourself. If you must walk through a planted field, walk between the rows.

#### Don'ts

- ✗ **NEVER** visit a stream alone. Always have someone with you who can go for help if an accident happens.
- ✗ **NEVER** drink from any stream. The water can look clean and clear and still be unsafe. It might contain toxic chemicals, bacteria from animal waste, or other things you DON'T want to drink.
- ✗ **NEVER** put your hands or feet in places where you cannot see. Watch where you're going and know where your next step will land.
- ✗ **NEVER** trespass on private property. You should always have permission from the land owner(s) before you visit a stream.



# Activity 7: Design Your Own Stream Study Kit!

## Goal

- ❖ To create street activity tools from inexpensive materials.

## Voluntary State Curriculum

1.0 Skill and Processes

A Scientific Inquiry: 1

**Time** 30 minutes

## Materials

- ✓ 1 waterproof carrying bag
- ✓ 1 small magnifying glass
- ✓ 1 pencil
- ✓ 3x5 spiral notebook
- ✓ Milk jug
- ✓ Screen, cheesecloth or white panty hose
- ✓ Silver duct tape
- ✓ Twine or yarn (at least 100 yards)
- ✓ 1 dishpan or bucket
- ✓ 1 small white shallow pan or plate
- ✓ pH kit
- ✓ Stream thermometers
- ✓ Juice can with both top and bottom cut off
- ✓ Plastic wrap

### Optional items

- ✓ Tweezers
- ✓ Waterproof boots
- ✓ 2 plastic bottles for stream samples (can use pill bottles)
- ✓ Plastic bug boxes
- ✓ Stream study journal with plastic cover
- ✓ Pocket field guides
- ✓ 6 inch stick

## Vocabulary

**Riparian Zone** – an area along the bank of a stream, river or other water body.



## Motivation

- ❖ Review “Maryland Water: An Evaluation of Stream Health”
- ❖ Read “Design Your Own Stream Study Kit”

## Procedure

Before going to the stream have students make the items below for their stream study kit. You might have individual kits for each student or you may want to have one kit for the entire group. Encourage children to use recycled materials as much as possible.

### Strainer

- 1) Cut top & bottom portion off milk jug.
- 2) Cut screening material to fit bottom.
- 3) Tape securely to outside with duct tape.

### Handmade Tape Measure

- 1) Cut twine or yarn at least 100 yards long.
- 2) Mark off foot lengths by tying knots.
- 3) Tie one end of the twine or yarn to a stick.
- 4) Wrap the remaining twine or yard around the stick.

### Water Looking Glass

- 1) Make sure that both ends are cut off the juice can.
- 2) Cut a piece of plastic wrap large enough to cover one end.
- 3) Tape securely to outside of can with duct tape.

Now assemble all of the above items and the other stream sampling equipment into a waterproof carrying bag and you are ready to go out to the stream.

## Modifications

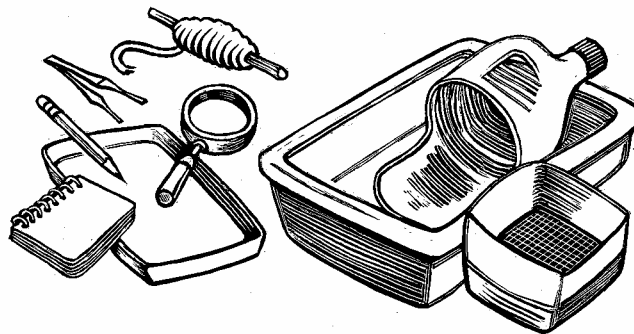
- ❖ Home assignment.

## Assessment

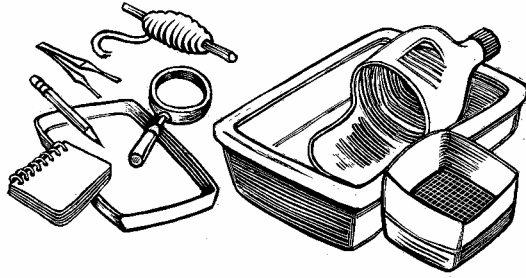
- ❖ Completed assignment.

## Optional Challenges/Extensions

- ❖ Journal.



# Design Your Own Stream Study Kit



List the items in your stream study kit here.

Check Off	Item	Check Off	Item

Use this list before each stream visit to check the contents of your stream study kit.

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# ***Maryland Waters: An Evaluation of Stream Health***

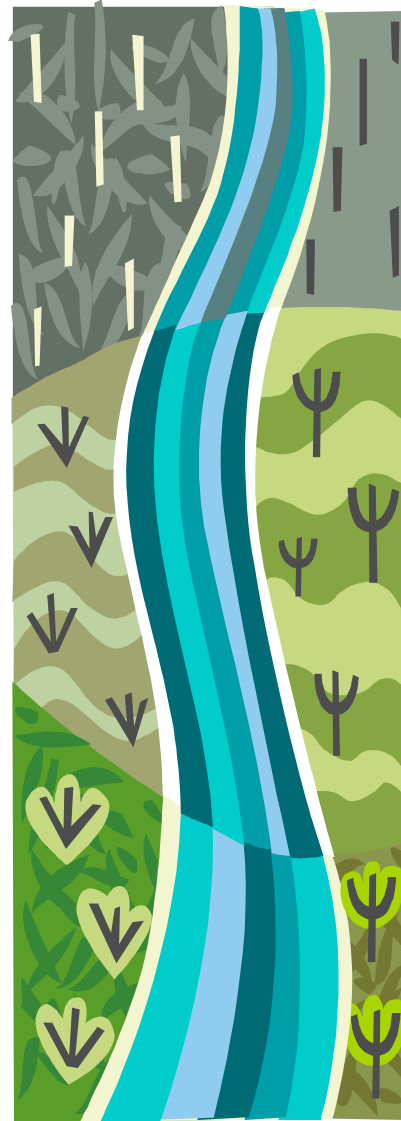
Freshwater streams are a valuable resource to us all. They are the lifeblood of the land around us. They connect our backyards, shopping malls, and farming fields to the Chesapeake Bay, the Atlantic Ocean, and the Gulf of Mexico. Our streams provide us with drinking water, recreation (places to swim, fish, canoe), transportation or simply places to escape from the bustle of daily life. It is important for us to understand how human activities affect natural processes; because what we do determines the health of our streams.

## ***Nutrients and Agriculture: Are They Related?***

Although Maryland DNR evaluates individual aspects of stream health, it is useful to combine several *indicators* of stream health (in this case fish and stream insect communities) to get a snapshot of overall stream condition. In a study released in 1997, the Maryland Biological Stream Survey rated almost half (46%) of all Maryland freshwater stream miles as poor, 42% fair, and only 12% good. These findings are consistent with the level of human disturbance in Maryland - even our forested watersheds are

impacted by stresses like acid rain and logging.

The primary and most widespread source of nutrients (nitrogen & phosphorus) in Maryland streams is



excess fertilizer from farm fields. Failing septic systems and animal manure also contribute to the problem, as well as air pollution from smoke stacks, auto exhaust, and lawn mowers. Statewide, 57% of all freshwater stream miles have higher

than normal levels of nitrogen and about 2% have nitrogen levels at which human health can be affected. In the Chesapeake Bay, the decomposition of algae blooms (caused by these elevated nitrogen levels) consumes the oxygen that fish and other aquatic life need to survive. By one estimate, Maryland's stream and river network is almost 13,000 miles long. When small, unmapped streams are included, the actual number is much higher! Human activity is readily evident throughout Maryland; the quality of streams closely reflects the level of human disturbance.

The *riparian zone* is an area along the banks of a stream, river, or other water body. Vegetated riparian zones act as a *buffer* against pollution and are therefore very important in reducing the impacts of human activities. Forested riparian buffers provide the best stream protection. They provide shade, stabilize stream banks, and supply food and shelter for aquatic and land animals.

### **Streams**

Once more than 3 million, there are now only about 300,000 brook trout living in Maryland streams. One important factor in the decline may be water temperature. As trees were cleared for agriculture and housing, previously forested streams were exposed to direct sunlight and hot water runoff from surfaces that cannot absorb the rain such as roads and rooftops. Other threats to brook trout include silt from construction and agriculture and acid rain.

To find out more about Maryland streams and their problems, check out our website at [www.dnr.maryland.gov](http://www.dnr.maryland.gov)

### ***How can I determine the health of my stream?***

One way is to take a look at the aquatic life that lives in the stream. You will find fish, crayfish, shellfish and a variety of aquatic insects under the rocks and in the leaf litter in your stream. The aquatic insects can tell us a great deal about the health of a stream. Unlike fish, aquatic insects cannot move around very much, so they are less able to escape the effects of sediment and other pollutants that harm water quality. Some species are very sensitive to water quality. They are particularly sensitive to the amount of oxygen in the water. In a healthy stream there are a variety of aquatic insect species. Only the hardiest of insects can survive in a polluted stream.



Mayfly



Stonefly



Caddisfly

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